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[Hide Items](#) | [Restore](#) | [Clear](#) | [Cancel](#)

DATE: Monday, December 27, 2004

<u>Hide?</u>	<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>
<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i>			
<input type="checkbox"/>	L30	I25 same (sequen\$9 near3 (activat\$4 or start-up or initializ\$9))	12
<input type="checkbox"/>	L29	I26 same (sequen\$9 near3 (activat\$4 or start-up or initializ\$9))	0
<input type="checkbox"/>	L28	I26 and (sequen\$9 near3 (activat\$4 or start-up or initializ\$9))	15
<input type="checkbox"/>	L27	I26 same application	43
<input type="checkbox"/>	L26	I25 same synchroniz\$9	364
<input type="checkbox"/>	L25	numerical adj control	16358
<input type="checkbox"/>	L24	I17 and I20	8
<input type="checkbox"/>	L23	I17 and L22	0
<input type="checkbox"/>	L22	I21 same control\$4	19
<input type="checkbox"/>	L21	I20 same application	31
<input type="checkbox"/>	L20	I19 same synchroniz\$9	665
<input type="checkbox"/>	L19	(initializ\$9 or (start-up)) near5 sequen\$9	11616
<input type="checkbox"/>	L18	I8 and I17	2
<input type="checkbox"/>	L17	I13 or I14 or I15 or I16	6418
<input type="checkbox"/>	L16	370/260.ccls.	439
<input type="checkbox"/>	L15	709/222,227.ccls.	2802
<input type="checkbox"/>	L14	703/22.ccls.	513
<input type="checkbox"/>	L13	713/1,2,100.ccls.	2800
<input type="checkbox"/>	L12	I8 same control\$4	18
<input type="checkbox"/>	L11	I8 same (numeric\$4 near3 control\$4)	0
<input type="checkbox"/>	L10	I8 same (control\$4 near5 object)	2
<input type="checkbox"/>	L9	I8 and (object adj oriented)	16
<input type="checkbox"/>	L8	(first near2 execution near2 environment) same (second near2 execution near2 environment)	52
<input type="checkbox"/>	L7	(first near2 execution near2 environment) and (second near2 execution near2 environment)	60
<input type="checkbox"/>	L6	I5 same application	2
<input type="checkbox"/>	L5	(object same (hierarchic\$9 near2 subordinat\$4))	26
<input type="checkbox"/>	L4	I3 same (application near5 object)	9
<input type="checkbox"/>	L3	(initializ\$9 near5 sequenc\$9)	8321
<input type="checkbox"/>	L2	I1	6436

*DB=USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR*

L1 (initializ\$9 near5 sequenc\$9)

6436

END OF SEARCH HISTORY

## First Hit    Fwd Refs

[Previous Doc](#)    [Next Doc](#)    [Go to Doc#](#)

Generate Collection | Print

L24: Entry 5 of 8

File: USPT

Feb 7, 1995

DOCUMENT- IDENTIFIER: US 5388215 A

TITLE: Uncoupling a central processing unit from its associated hardware for interaction with data handling apparatus alien to the operating system controlling said unit and hardware

### Detailed Description Text (1137) :

Each processing section 12 of the units 21, 23 includes logic circuits, typically in the processor status and control stage 86 to bring the two partner units into lock-step synchronization. The section 12 attain lock-step synchronization with the transition to Master status. Each section 12 must be in the Master state in order for it to drive signals onto the bus structure. The initializing sequence stored in each PROM 181 typically includes instructions for bringing the partnered sections into synchronization and to ensure that neither processing section is in the Master state initially, i.e., upon being turned on.

Detailed Description Text (1138) :

The processing sections 12 of the units 21, 23 are not in synchronization initially in the initializing sequence and one unit attains the Master state during a multi-phase cycle prior to the other. The one unit obtaining Master status controls the further initializing operation of the other unit to bring it into the Master state at a selected time.

Current US Cross Reference Classification (1):

703/22

Current US Cross Reference Classification (4):

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709/227

[Previous Doc](#)    [Next Doc](#)    [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#) [Generate Collection](#) [Print](#)

L10: Entry 1 of 2

File: USPT

Oct 20, 1992

DOCUMENT-IDENTIFIER: US 5157777 A

TITLE: Synchronous communication between execution environments in a data processing system employing an object-oriented memory protection mechanism

Abstract Text (1):

A subsystem call mechanism for communicating between a first execution environment associated with a first domain object, and a second execution environment associated with a second domain object. An environment table object is associated with a process object. The environment table object includes a control stack which is an array of control stack entries which entries save the state of the first calling execution environment to be restored on a return from the second execution environment. A subsystem entry in the subsystem table specifies the object that defines region 2 of the target execution environment and the frame pointer of the topmost stack frame in the target environment, a supervisor Stack Pointer that is a linear address for the supervisor stack used when involving a supervisor call in the user mode (instead of the stack pointer in the current frame) to locate the new frame. The first domain object further includes Procedure Entries that specify the type and address of the target procedure. Each of the procedure entries includes a Procedure Entry Type field that indicates the type of procedure to be invoked, either a supervisor procedure or a subsystem procedure, and an offset into the target execution environment. The offset specifies the first instruction of the target procedure.

Brief Summary Text (14):

Briefly, the above objects are accomplished in accordance with the invention by providing a first processor object and a first process object defining a first execution environment associated with a first domain object, and a second execution environment associated with a second domain object. A first environment table object is associated with the first process. The first environment table object includes a control stack for containing subsystem linkage information, the control stack being an array of control stack entries which entries save the state of the first calling execution environment to be restored on a return from the second execution environment.

[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#) [Generate Collection](#) [Print](#)

L30: Entry 1 of 12

File: USPT

Nov 9, 2004

DOCUMENT-IDENTIFIER: US 6816609 B1

TITLE: Vision measuring machine, method, and medium

Brief Summary Text (5):

Conventionally, manually operating vision measuring machines and CNC (Computerized Numerical Control) vision measuring machines are used for inspection of ICs, read frames, IC packages, and so on. Generally, in measurement using a vision measuring machine, an object to be measured (workpiece), such as an IC, is placed on a stage, and photographed by an imaging means, such as a camera, so that an image thereof is displayed on a CRT. Subsequently, a part program for workpiece measurement is activated. A part program is a program prepared by storing information on a series of measurement procedures for one sample, taught by an operator, as well as information on the position and shape of the workpiece. When a part program is activated, commands are sequentially read from a prepared part program file. In response to a stage moving command, a driving means moves the stage. In response to a tool command, images of tools, such as a box tool, a circular tool, and so on, are added to a workpiece image displayed on the CRT. In this procedure, an edge point is detected using the provided tool, and a continuous edge is approximated from detected points using a least square method or the like. In response to an operation execution command, a designated operation, such as a line width operation, a circle center operation, a circle radius operation, and so on, is executed with respect to the workpiece image, based on the continuous edge.

[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#) [Generate Collection](#) [Print](#)

L30: Entry 2 of 12

File: USPT

Apr 9, 1996

DOCUMENT-IDENTIFIER: US 5506787 A

TITLE: Configurable man-machine communication structure for machine tool or robot control systems

## CLAIMS:

1. A numerical control system for machine tools or robots, in which an object-oriented programming takes place, in that object classes are provided, from which a number of objects can be formed, and a message mechanism exists for communication with other objects, comprising:
  - a) a man-machine interface for inputting user information;
  - b) a sequence control;
  - c) a plurality of object classes for abstract types of data, including data on machining, geometry, kinematics, and technology;
  - d) a special object class for abstract types of control data, wherein said special object class has one or more control data generating methods;
  - e) an integrated numerical control kernel, which can take the form of an object class, wherein any number of objects can be formed from each of the plurality of object classes, wherein each of said objects has its own data area;
  - f) a procedure part for executing one or more methods, including machining methods, geometry methods, kinematic methods or technology methods; and
  - f) a message mechanism for communication with other objects, wherein any number of objects can be formed from the special object class, the user information input via the man-machine interface is interpreted by the sequence control and leads to an activation of selected objects, the activated objects exchange mutually required information by means of their message mechanisms, the activated objects contribute their share of control data generation status-dependently directly or by means of further objects and consequently form an executable functional unit for the numerical control system, the sequence control itself takes the form of an object class, the objects of which have methods that allow a status-dependent interpretation of an abstract description of an operating sequence from a control-internal data management.

[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#) [Generate Collection](#) [Print](#)

L30: Entry 3 of 12

File: USPT

Mar 12, 1996

DOCUMENT-IDENTIFIER: US 5497980 A

TITLE: Assembly for use in precision machining

Brief Summary Text (5):

In the production of workpieces which have been subjected to some number of machining operations in order to produce, at (and precisely at) certain predetermined locations, certain predetermined desired machined features--holes of desired diameter and depth, slots, grooves, etc.--it is already well known to provide and use for such purposes some kind of so-called "numerical control" (NC) equipment, that is to say, equipment of a kind which includes not only the means for securing the workpiece and the drill or milling head or other tool for producing the desired features in the finished workpiece, but also a programmable computer means which will, in accordance with a program provided thereto, sequentially position and activate and de-activate the various tools that are to be brought into contact with the workpiece during a cycle of the operation thereof. When the task to be accomplished includes the making of some number of product workpieces which are intended to be as nearly identical and interchangeable as possible, which is often the case, the improvement in productivity which is obtainable with the use of such equipment, in contrast to the relative inefficiency of having the pieces made by a skilled machinist who repetitively performs the necessary manipulations, is immense. Given properly programmed NC equipment, a relatively unskilled machine operator can produce, in a remarkably short period of time, a number of machined workpieces which are reliably identical; the machinery operates--without error, hesitation, or interruption caused by fatigue or distraction--to subject each workpiece in its turn to the operation required.

[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)

## First Hit    Fwd Refs

[Previous Doc](#)    [Next Doc](#)    [Go to Doc#](#)

**Generate Collection**  **Print**

L30: Entry 5 of 12

File: USPT

Oct 15, 1985

DOCUMENT-IDENTIFIER: US 4547847 A  
TITLE: Adaptive control for machine tools

Drawing Description Text (25) :

FIG. 13A through FIG. 13H comprise a flowchart of a numerical procedure for execution in the numerical control unit of FIGS. 8 and 9 to adaptively control the vertical turret lathe shown in FIG. 7 as shown in the timing diagram of FIG. 12. Specifically, FIG. 13A is a flowchart of the executive program executing the adaptive control procedure outlined in FIG. 5A. FIG. 13A' shows the modification of the executive program in FIG. 13A required for executing the adaptive control procedure outlined in FIG. 5B. FIG. 13B is a flowchart of the subroutine TEST used by the executive program of FIG. 13A to determine the next commanded values of SEM and IPR based on a comparison of the estimated desired machining rate to threshold levels. FIG. 13C shows the subroutine PCD for determining the program constants of friction  $M_s$  and  $B$ , and the moment of inertia  $J$ . FIG. 13D shows the first part of the 32 mS interrupt procedure which performs the feedhold and initializing velocity control sequences. FIG. 13E shows the second part of the 32 mS interrupt procedure including the reading of the part program memory, calculation of path vectors, and the soft engagement and disengagement functions. FIG. 13F is a flowchart of the axis subroutine which generates the feed and drive control signals. FIG. 13G is a flowchart of the 64 mS interrupt which periodically calculates the actual cutting power at the cutter edge.

[Previous Doc](#)    [Next Doc](#)    [Go to Doc#](#)

## First Hit    Fwd Refs

[Previous Doc](#)    [Next Doc](#)    [Go to Doc#](#)

**Generate Collection**  **Print**

L30: Entry 10 of 12

File: USPT

Jun 14, 1977

DOCUMENT- IDENTIFIER: US 4029950 A

**TITLE:** Numerical control system for machines utilizing a programmable sequence controller

Brief Summary Text (5) :

In general, in a direct control system using a computer to control numerically controlled machine tools, there has been extensively adopted a system with so-called BTR-adapters 4, 4, as shown in FIG. 1. In this system, numerical control data are supplied through the BTR-adapters 4, 4, each serving as a data link device, not from tape readers 6, 6 of numerical controllers 2, 2, but from a central computer 1. The numerical control data supplied through the BTR-adapter 4 is decoded in the numerical controller 2, roughly to a feed control data and an auxiliary function data, the former of which is processed under interpolation arithmetic to be distributed to servomotors, the auxiliary function data being then transmitted to an auxiliary function control device 7 to instruct a functional operation corresponding thereto. The functional control device 7 is ordinarily constructed by relay circuits and performs a sequence control by activating a relevant relay in accordance with the auxiliary function data.

[Previous Doc](#)    [Next Doc](#)    [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#) [Generate Collection](#) [Print](#)

L30: Entry 11 of 12

File: USPT

Aug 6, 1974

DOCUMENT-IDENTIFIER: US 3828318 A

TITLE: OPERATOR PROGRAMMED NUMERICAL CONTROL SYSTEM

Abstract Text (1):

A numerical control system specifically designed for programming by the machine tool operator and a simplified programming method therefor which allows the control to be completely programmed by the operator without resort to complex data bearing media or codes. The operator begins by examining some description of the required machining operations such as a part drawing to determine the desired positioning operations and the sequence of positioning steps. The co-ordinates of each step in the positioning sequence are determined relative to some predetermined reference point or "zero position". The digital information relating to each such step is programmed into the control by placing that information into data switches on each of a plurality of program panels. The control system is then activated to sequence operation by transferring the contents of the first of these control panels into the control and then carrying out the positioning operation specified in that particular panel. After the desired position is reached, a machining operation takes place and the control system sequences to the next program panel and carries out the next step in the positioning sequence.

Detailed Description Text (68):

As will be recalled from the foregoing description of the numerical control system of the present invention, the command data are supplied from a plurality of program panels as shown in FIG. 3. The program panels, are sequentially activated to indicate the desired position of the controlled machine tool in any particular step of the program sequence. A brief, but nonetheless accurate, description of the basic operation of the numerical control system of the present invention is that the information from the program panels is sequentially transferred to the control system as dictated by a sequencing counter 126.

Detailed Description Text (69):

The sequencing counter 126 initiates the transfer of positioning information from the program panels 32, 34, 36 to the control system in the proper sequence and at the proper time to carry out the desired machining operations in the appropriate sequence of operational steps. Sequencing counter 126 is a reversible counter of sufficient capacity to sequentially activate the required number of program panels of the numerical control system. The Sequencing Counter is a conventional UP-Down counter with individual counter outputs each connected to supply an activating pulse to one program panel as shown in FIG. 6. Each program panel may constitute any known system for manually presetting a numerical value which is fed into a counter upon the reception by the panel of a strobe or activating pulse. Such systems are widely used to preset tare into counters in electronic weighing units (U.S. Pat. No. 3,665,169) or to preset other values into a counter system (U.S. Pat. No. 3,604,903).

## CLAIMS:

1. A numerical control system for positioning a machine tool along at least one axis of movement by moving said tool from a start position along said axis to a desired position, said system comprising movement sensing means operative to sense

direction of movement of said machine tool and distance of movement in increments from said start position, said movement sensing means operating to provide a first output signal indicative of said direction of movement and a second output signal for every increment of distance traveled by said machine tool from said start position, actual position indicating means connected to receive said first and second output signals from said movement sensing means and operative to derive therefrom a digital value indicative of the present position of the machine tool along said axis, a plurality of program panel means for providing a sequence of numerical control data for moving said machine tool to a sequence of desired positions along said axis, each of said program panel means including at least one control data set means which may be manually operated to preset a digital value therein indicative of a desired position along said axis, said control data set means operating upon receipt of an activating signal to provide a digital output signal indicative of the digital value preset therein, sequencing means for sequentially activating the control data set means of said plurality of program panel means, adder/subtractor means operatively connected to said actual position indicating means and to said program panel means, said adder/subtractor means operating to compare the digital output signal from said control data set means with the digital value indicative of the present position of the machine tool from said actual position indicating means and to generate a first digital output signal indicative of the distance from the machine tool to the desired position and a second output signal indicative of the direction for the machine tool to travel to the desired position and drive means operatively connected to receive said first and second output signals from said adder/subtractor means, said drive means operating to control the positioning of said machine tool along said axis.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)